

In the Claims

Please cancel claims 6, 24, 65 and 68 and amend claims 1, 7, 20, 22-23, 25, 40, 43-47, 49-50, 62-63, 66-67, and 69 as follows:

1. (Currently amended) A method to prepare a porous ~~a cross-linked sol-gel~~ material comprising:
(a) contacting a preformed sol-gel material with a cross-linking agent comprising an organic compound to provide a[[the]] cross-linked sol-gel material; and
(b) drying the cross-linked sol-gel material to form the porous material.
2. (Original) The method of claim 1, wherein the cross-linking agent is an isocyanate.
3. (Original) The method of claim 1, wherein the cross-linking agent comprises a diisocyanate, an acid anhydride, an acylchloride, a bis(acid anhydride), or a bis(acylchloride).
4. (Original) The method of claim 1, wherein the cross-linking agent comprises an attached group.
5. (Previously Presented) The method of claim 4, wherein the attached group is an absorbant, a catalyst, a fluorophore, a biomolecule, a redox active label, or a reactive group.
6. (Canceled)
7. (Currently amended) The method of claim 1[[6]], wherein the cross-linked sol-gel material is based on silica.
8. (Previously Presented) The method of claim 1, wherein the sol-gel material is substantially filled with a solvent.

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9. (Previously Presented) The method of claim 8, wherein the solvent is selected from the group consisting of water, ketones, alcohols, esters, carbonates, lactones, hydrocarbons, and mixtures thereof.
 10. (Original) The method of claim 9, wherein the alcohol is methanol or ethanol.
 11. (Original) The method of claim 9, wherein the ketone is acetone.
 12. (Original) The method of claim 9, wherein the solvent is propylene carbonate, ethyl acetate, or butyrolactone.
 13. (Previously Presented) The method of claim 1, wherein the sol-gel material is based on silica.
 14. (Previously Presented) The method of claim 13, wherein the silica is prepared from silicon alkoxides via an acid or a base-catalyzed route.
 15. (Original) The method of claim 1, wherein the cross-linking agent is in a solvent.
 16. (Original) The method of claim 15, wherein the solvent is selected from the group consisting of water, alcohols, ketones, esters, carbonates, lactones, and mixtures thereof.
 17. (Original) The method of claim 16, wherein the alcohol is methanol or ethanol.
 18. (Original) The method of claim 2, wherein the isocyanate is a monoisocyanate, a diisocyanate, a triisocyanate, a tetraisocyanate, a polyisocyanate, an oligoisocyanate, or a combination thereof.

19. (Original) The method of claim 2, wherein the isocyanate is hexamethylene diisocyanate, poly(hexamethylene diisocyanate), toluene diisocyanate, diphenylmethane diisocyanate, an aliphatic polyisocyanate, triphenylmethyl triisocyanate, or a mixture thereof.
20. (Currently amended) The method of claim 1[[6]], wherein the sol-gel material is dried supercritically.
21. (Previously Presented) The method of claim 20, wherein the sol-gel material is dried with liquid carbon dioxide.
22. (Currently amended) The method of claim 1[[6]], wherein the drying is conducted at ambient pressure.
23. (Currently amended) A porous material produced according to the method of claim 1.
24. (Canceled).
25. (Currently Amended) A cross-linked sol-gel material, wherein a[[the]] cross-linking agent comprising an organic compound is deposited on[[the]] surfaces surrounding [[the]] internal pores of a preformed sol-gel material so as to form a cross-linked sol-gel material.
26. (Previously Presented) The cross-linked sol-gel material of claim 25, wherein the cross-linking agent comprises at least about 2% by weight of the cross-linked sol-gel material.
27. (Previously Presented) The cross-linked sol-gel material of claim 25, wherein the cross-linking agent comprises at least about 5% by weight of the cross-linked sol-gel material.
28. (Previously Presented) The cross-linked sol-gel material of claim 25, wherein the cross-linking agent comprises at least about 10% by weight of the cross-linked sol-gel material.

29. (Previously Presented) The cross-linked sol-gel material of claim 25, wherein the cross-linking agent comprises at least about 30% by weight of the cross-linked sol-gel material.
30. (Previously Presented) The cross-linked sol-gel material of claim 25, wherein the cross-linking agent comprises at least about 50% by weight of the cross-linked sol-gel material.
31. (Previously Presented) The cross-linked sol-gel material of claim 25, wherein the cross-linking agent comprises at least about 80% by weight of the cross-linked sol-gel material.
32. - 35. (Cancelled)
36. (Previously Presented) The cross-linked sol-gel material of claim 25, wherein the sol-gel material is based on silica.
37. (Previously Presented) The cross-linked sol-gel material of claim 25, wherein the cross-linking agent is an isocyanate.
38. (Previously Presented) The cross-linked sol-gel material of claim 25, wherein the cross-linking agent is hexamethylene diisocyanate, poly(hexamethylene diisocyanate), toluene diisocyanate, diphenylmethane diisocyanate, an aliphatic polyisocyanate, triphenylmethyl triisocyanate, or a mixture thereof.
39. (Previously Presented) The cross-linked sol-gel material of claim 25, wherein the cross-linked sol-gel material is stronger or more robust than a non-cross-linked-sol-gel material.
40. (Currently amended) The cross-linked sol-gel material of claim 25[[68]], wherein the cross-linked sol-gel material is an aerogel and the cross-linked sol-gel material does not collapse when in contact with a liquid that comprises water, an alcohol, an ether, a hydrocarbon, an ester, a ketone, a carboxylic acid, a phosphoric acid, or a liquefied gas.

41. (Previously Presented) The cross-linked sol-gel material of claim 40, wherein the liquefied gas is nitrogen, argon, helium, hydrogen, or oxygen.
42. (Previously Presented) The cross-linked sol-gel material of claim 40, wherein the hydrocarbon is kerosene, gasoline, jet fuel, or rocket fuel.
43. (Currently Amended) A method to link an attached group to a[[an]] sol-gel material comprising:
- a) contacting a preformed sol-gel material with a cross-linking agent comprising an organic compound that includes the attached group to form a cross-linked sol-gel material; and
 - b) drying the cross-linked sol-gel material.
44. (Currently Amended) A capacitor comprising[[a]] ~~the cross-linked sol-gel material of~~ claim 23.
45. (Currently Amended) A dielectric comprising[[a]] ~~the cross-linked sol-gel material of~~ claim 23.
46. (Currently Amended) An electrical circuit comprising[[a]] ~~the cross-linked sol-gel material of~~ claim 23.
47. (Currently Amended) A thermal insulating material comprising[[a]] ~~the cross-linked sol-gel material of~~ claim 23.
48. (Original) A tile, door, panel, shingle, shutter, beam, cooler, article of clothing, shoe, or boot comprising the thermal insulating material according to claim 47.

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49. (Currently Amended) A structural material comprising[[a]] the cross-linked sol-gel material of claim 23.
50. (Currently Amended) A method to dry[[a]] the cross-linked sol-gel material of claim 1 comprising:
- a) washing the cross-linked sol-gel material, wherein the cross-linked sol-gel material is filled with a solvent, with a new solvent to [[:]] exchange[[the]] pore-filling solvent of the cross-linked sol-gel material with[[a]] the new solvent; and
 - b) drying the solvent-exchanged cross-linked sol-gel material under non-supercritical conditions.
51. (Original) The method of claim 50, wherein the drying is conducted at ambient pressure.
52. (Original) The method of claim 50, wherein the drying is conducted at a temperature that is at least about 4°C.
53. (Original) The method of claim 50, wherein the drying is conducted at a temperature that is at least about 20°C.
54. (Original) The method of claim 50, wherein the drying is conducted at a temperature that is at least about 40°C.
55. (Original) The method of claim 50, wherein the drying is conducted at a temperature that is at least about 60°C.
56. (Original) The method of claim 50, wherein the drying is conducted at a temperature that is at least about 80°C.
57. (Original) The method of claim 50, wherein the drying is conducted at a temperature that is at least about 100°C.

58. (Original) The method of claim 50, wherein the drying is conducted at a temperature that is at least about 200°C.
59. (Original) The method of claim 50, wherein the drying is conducted at a temperature that is about or less than 300°C.
60. (Original) The method of claim 50, wherein the drying is conducted at a temperature of about 40°C.
61. (Original) The method of claim 50, wherein the drying is by freeze-drying.
62. (Currently amended) The method of claim 50, wherein the new solvent is an organic solvent.
63. (Currently amended) The method of claim 62[[50]], wherein the organic solvent comprises a (C₁-C₂₀)alcohol, a (C₁-C₂₀)alkane, a (C₁-C₂₀)cycloalkane, a (C₁-C₂₀)alkene, a (C₁-C₂₀)cycloalkene, a (C₁-C₂₀)alkyne, an aryl, a (C₁-C₂₀) alkane substituted aryl, a (C₁-C₂₀)alkene substituted aryl, or a (C₁-C₂₀)alkyne substituted aryl.
64. (Original) The method of claim 62, wherein the organic solvent is a (C₅-C₁₀)alkane.
65. (Canceled).
66. (Currently amended) The method of claim 1 wherein[[a]] the chemical functionality of [[the]] surfaces surrounding[[the]] pores of said sol-gel material acts as a template for reaction with the cross-linking agent.
67. (Currently amended) The method of claim 1 wherein[[the]] surfaces surrounding[[the]] pores of the sol-gel material act as a template for the cross-linking agent.

68. (Canceled).
69. (Currently amended) The cross-linked sol-gel of claim 25 wherein a[[the]] chemical functionality of the surfaces surrounding the pores of said sol-gel material acts as a template for[[;]] reaction with, accumulation of, or both[[;]], the cross-linking agent.
70. (Previously Presented) The cross-linked sol-gel of claim 25 wherein the surfaces surrounding the pores of the sol-gel material act as a template for the cross-linking agent.